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Are supermarkets an appropriate tool for facilitating the transition to low input farming practices?

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Abstract: Transition towards low input farming practices involves a transition of a whole complex socio technical agro-food system of which supermarkets are an important element as they represent up to 75 % (GB) of the European food distribution and their market share is increasing in Central Europe. Against this background, the paper's objective is to explore whether supermarket procurement policies could be potential tools both for the adoption of integrated pest management (IPM) strategies by the producers and for increasing the choice of consumers. Our hypothesis is that the influence of supermarket on farmers' practices about pesticides is limited by the very production system that they have contributed to build. The paper is based on interviews of actors of the pome fruit production chain and on exploratory focus groups with apple consumers that were achieved, at local scale, by partners within the European Network of Excellence ENDURE. Actually, supermarkets participate in the implementation of what is considered as the first stage of Integrated Protection (IP) i.e. reducing the risks linked to pesticide use. Despite the creation by some supermarket brands of schemes that explicitly refer to non chemical pest protection practices the supermarkets contribution to more advanced forms of IPM can be questioned. Against this background, the way in which the consumers/citizens articulate the issue of production modes and their environmental or social impacts with the issue of pome fruit quality and, maybe with the type of retail they choose will be an important element for understanding the supermarket capacity for change.

Keywords: pesticides, supermarkets, low-input practices, Integrated Pest Management (IPM), consumers.

Introduction

Since the publication in 1962 of Silent Spring by Rachel Carson, the pesticides negative side effects on the Environment are part of the political agenda. In the 70s, the side effects on human health also became part of the debate and efforts to apply pesticides more cautiously and to develop non-chemical alternatives in pest control, led to the popularization of the concept of integrated pest management (IPM) (Hough, 2000). In Europe, the debate on pesticide use and the rising concern about the pesticide impact on human health (Haynes et al., 2009) has led public authorities and, in 2008/2009 the European Parliament (EP) (Speight, 2009), to regulate the risks linked to pesticide use and to promote the IIPM (Directive 2009/128/EC, Art. 14.2). However, at field level, IPM is so far translated into practices which are often very different: while some focus on risk reduction practices that doesn't challenge their current conception of the farming activities (for example maintenance of the spraying equipment or avoidance of leaks), other re consider the whole farming system and implement for example, new crop rotations (Lamine et al, 2008). Actually, from an agronomical perspective, IPM is considered as a transition that goes from the maximisation of the efficiency of pesticide use within the current crop protection system to the adoption of non-chemical strategies and the redesign of the production system. The ESR 'Efficiency, Substitution, Reduction' model of transitions defines three steps (Hill & Mac Rae 1995):

1. Efficiency i.e. focus on the fine-tuning of existing practices to reduce consumption and waste. At field level this is translated by farmers and extensionists as the use of Good Agricultural Practices (GAP) and Decision Support Systems (DSS) that takes into account elements such as the weather forecast and the pest pressure. GAP can be technical (maintenance of the spraying equipment, avoiding drifts or leaks when spraying or cleaning the machines, storing of pesticides in water proof and closed rooms), behavioural (wearing protective gears, avoiding to spray next to water caption and rivers, documenting the sprays) and can also introduce forms of training (attending specific sessions on pesticide use).

2. Substitution i.e. resource-dependent and environmentally disruptive products and procedures are replaced by those that are more environmentally benign. Scouting, biological control and low-toxicity pesticides - may replace the routine use of conventional pesticides without challenging the cropping system. It should be noticed that substitution strategies induce extra labour costs (scouting, implementation of pheromone traps in the orchards for example) which represent (in Western EU) an important additional constraint for a crop in which those costs can already account for more than 45 % of the total production cost (Codron et al., 2008).

3. Redesign i.e. a more holistic approach that fosters long-term sustainability is achieved. Instead of responding by trying to minimize the symptoms of a problem, the whole cropping system is re considered taking into account ecological balances for example the orchard surroundings are taken into account including the impact that beneficial organisms living in near-by hedges and non cultivated areas can have.

At research, advisory or farm level, IPM is used as a kind of generic term which hardly refer to the same notion: IPM according to a member of the International Organisation for Biological and integrated Control of noxious animals and plants (IOBC) will probably not be the same as IPM for a supermarket controller or a civil servant working for the ministry of agriculture. The practical positive outcome of such a situation is that most stakeholders will not disagree on the idea of implementing IPM.

Against this background, because supermarkets represent up to 75 % of the food distribution and are major stakeholders in the food network, and because their quality schemes are presented as “a fundamental qualification tool for the European agro food supplying and more generally for the EU agro food production system” (Segré et al., 2005), the paper’s objective is to explore whether supermarkets procurement policies or their certification schemes could be potential tools both for the adoption of low input strategies by the producers and for increasing the choice of consumers.

Our hypothesis is that, the influence of supermarket on farmers for implementing low input practices is limited by the very production system that they have contributed to build.

For exploring the supermarket food system we adopted a network analysis perspective. In this respect we will see that codes of conducts but also grading machines, consumers, counsellors, controllers, sorting machines and pesticide regulation plays a role in the implementation of pesticide risk reduction strategies.

Our fieldwork was held within the European Network of Excellence ENDURE¹ in five Western EU countries: France (FR), Great Britain (GB), The Netherlands (NL), Italy (IT), Switzerland (CH) and in two Central EU countries: Poland (POL), Hungary (HUN). Central Europe countries where supermarkets started their implementation in the 90s and constantly increase their market shares (Wierzbicka, 2009; Lehotà et al, 2009) gave the opportunity to observe the introduction of supermarket procurement policies. To the request of the ENDURE program, the fieldwork was focused on pome fruit production which was all the more interesting that, because fruit are consumed raw, they are often considered as a symbol of the pesticide threat on human health (Haynes et al., op.cit). Comprehensive face-to-face interviews of the actors of the pome fruit chain (producers, producers’

¹ <http://www.endure-network.eu>

organisations (POs), supermarket buyers)² were conducted in FR, CH, NL, HUN and POL. They were completed with document analysis. The consumers' perceptions were explored, at local scale, in NL, GB, FR and IT through two focus groups in each country: one centred on upper middle class consumers, the other on lower middle class ones with a couple of organic-(but non-exclusive organic) consumers in each group so as to sustain the debate.

In a first part, we will explore the relationships between supermarket procurement standards and pesticide use. Against this background, we will then consider the various IPM strategies implemented by supermarkets: risk reduction procurement strategies and certification schemes referring to IPM.

The inter-relation between supermarket procurement standards and pesticide use.

After harvest, pome fruit as other fruit are sorted by a machine according to their weight (the bigger, the higher price) and to their skin quality³. When too small or with imperfect skin, the fruit is rejected by the machine and sold at a much lower price to the food industry to make juices or jams. Indeed supermarkets request the fruit skin to reach perfect visual standards: no stains, regularity of the skin, and no trace of insect bites. The contour of the peduncle is the only area where small skin imperfections are allowed: the machine is unable to spot this area. Those requirements drive growers to avoid insects (codling moth), diseases (apple scab) and russetting all of which leave traces on the fruit skin by using pesticides : they are a must have in every conventional farm. Actually, the impact of skin standards is very important on pesticide use (Codron et al., op.cit); for example, according to ENDURE scientists in humid geographical zones up to 70 % of fungicide use is made for avoiding the stains linked to the apple scab, it was already the case in The Netherlands in 1997 (Statistics Netherlands, 1997)

The tuning of the grading machine translates the norms created by supermarkets into a sorting technique that determines the income of the growers. Therefore a way for allowing the decrease of pesticide use would be a change in the supermarket norms linked to their acceptance of lower skin quality. If we consider that quality in general is a social construction (Nicolas et al, 1995), so is fruit quality and supermarkets participate in it. However, the supermarket representatives that we interviewed were quite reluctant about reducing their demands about skin quality although they acknowledge the fact that they have participated in constructing the consumer demand *"The retail industry have created standardisation...As the time goes, we have selected our fruit so much that a single error (a fruit with a stain for example) is a shock for the consumer even if historically the supermarkets have created this demand"* (Supermarket representative, France, 2008). They consider that it will be difficult to go backwards. First of all because it has become part of their competitive position towards other forms of retail and, as such, together with other requirements such as size and sugar level, it has become a basic request of their procurement strategy. According to a manager physical quality i.e. "cosmetic" standards are perceived as a sign of modernity and development *"the richer you get the more perfect you want the products... It's like car selling. You like your old beetle but next to it is the new WV... more fashionable and you think...it's great"*. De facto, in Poland, Tesco sales of First class apples was 54, 4 % of their total sales in 2004 and 85, 0 % in 2008. This situation has strong consequences: for example as Polish apples were said to be too small and not sugary enough (Galas et al., 2004), new cultivars were planted. Similarly, in Hungary, new plantation programs of varieties with bigger fruit and good adaptation to storage were introduced as early as in

² FR: four representatives of POs, seven growers (+ a group interview of 4 growers), one certifier, two representatives of supermarkets.

NL: One representative of a producer organisation (there is no other certification scheme than the business- to-business GlobalGAP in this country).

CH: Seventeen growers, one ex-advisor of a supermarket certification scheme and one supermarket representative.

HUN: Interviews of eleven producers , six wholesalers, two super-, and hypermarket representatives (Hungarian and international)

POL : Three growers, three representatives of POs and two supermarket representatives

³ When the machine is equipped with an advanced electronic camera (when it is not this sorting is hand made). There are categories of Fruit weight (1 and 2) and of Fruit skin

1996 with State support (Takácsné, 2003). Secondly, supermarkets assume that consumers are used to such quality and that their competitive position would be at risk if a change was introduced in the fruit shelf. However, such a statement can be questioned as consumers actually will buy what they find and are still buying less perfect fruit on market stalls, through direct sales or in small shops. Even when supermarkets such as in Western EU have a leading market share, consumers could be much more flexible in their fruit choice than what supermarket representatives suggest. For example, results of the focus groups in France (Table 1) suggest that apples with russeting are accepted by consumers but that it is more difficult, however not impossible, for them to consider using apples with worm bites and scab stains. One of the reasons is that consumers consider buying them for cooking purposes.

Table 1. Acceptance of skin imperfection on apples according to the prospective usage (nb answers).

Usage	To eat raw	To cook	No usage	No answer	Total
Russeting	10	1	0	1	12
Worm bites	3	4	3	2	12
Scab around the peduncle	3	1	2	6	12

Source: focus groups. Rhone valley area. 2009

However, a few supermarkets in GB and France are considering emphasising the fruit taste rather than the physical aspect by putting some “ugly but good products” on part of their fruit shelves. This notion targets fruit with smaller size or imperfect shape rather than the skin quality and allows a lesser use of defoliant- which are herbicides.

A second way of decreasing pesticide use while maintaining the skin aspect requirements would be to market pest resistant cultivars developed by various research institutes (“Ariane” and “Choupette” by INRA; “Ariwa” by Agroscope for example). But supermarkets are very cautious regarding the introduction of a new fruit variety on their fruit shelf, either because they consider that sooner or later the resistance will be overcome, either because their fruit shelves’ length is limited and they want to keep their supply range as it is, or because the volume produced by growers are not big enough for supplying all their stores (in the case of central procurement systems). In any case, they show a very conservative strategy on this issue. This is questionable. When marketed properly (for example, there is a marketing club promoting the Ariane variety in France), those apples offer an interesting shelf segmentation opportunity for retailers⁴.

The supermarket demand for perfect skin aspect is therefore a major bottleneck for the evolution towards less pesticide use within the conventional production system. With perfect skin as a constraint, supermarkets have adopted a double sided strategy. On the one hand they focus on reducing the risks linked to pesticide use (rather than decreasing the use itself); on the other hand, some of them have introduced certification schemes that explicitly refer to IPM.

A focus on risk reduction

Supermarkets will is to prevent the negative business consequences of the food scares and to maintain the consumers’ trust in the quality of their products. A way to do so is to anticipate any food safety issues that could occur in the short-middle term by anticipating the evolution of the legal food production rules and creating insurance schemes thanks to procurement standards often embodied in specific certification schemes (Interview, supermarket 2007). Actually, many certification schemes were created after the first mad cow disease crisis (1986-1993). For example Carrefour’s “Engagement Qualité” started in 1991; GlobalGAP a business to business certification scheme was created in 1997 by Northern EU supermarket brands (Schneider et al., 2006). As supermarkets fear the consumers’ reaction linked to pesticide use and consider that many producers still don’t respect basic safety regulations, their risk reduction policies target growers’ practices and the respect of the legal Maximum Residue Levels (MRLs).

⁴ Jacquemoud, F. La pomme Ariane arrive en force dans les rayons in Points de Vente. 13 October 2008.

Supermarkets require their fruit suppliers to adopt Good Agricultural Practices that contribute to the safety of pesticide use both for the labourers and for the environment. They reflect, at field level, the Hazard Analysis Critical Control Points (HACCP)⁵ that has been implemented for long within the food industry. In other words supermarkets require what is referred to as “Efficiency” in the ESR model described in the introduction. Supermarkets have complemented these requirements by implementing:

- Traceability procedures based on a labelling system that allows tracing fruit from the point of sale back to the producer or the producer organisation. It is a way of sharing the risk responsibility along the food chain. The ultimate reference is the producer’s logbook where sprays are documented and must often be justified.

- MRLs controls when receiving the fruit. They often complement those made by public bodies in the various countries as, according to the interviewees, the latter don’t always have enough civil servants for achieving controls on a satisfactory range. It is all the more important that many NGOs in Western Europe particularly in Germany, Great Britain and The Netherlands have focused their campaigns on the respect of MRLs hence raising consumers awareness and making a strong pressure on supermarkets (Haynes et al., op. cit). At farm level, in many cases, respecting MRLs means carefully management of the spraying agenda to avoid spraying too close to harvest time. According to all the interviewees, this doesn’t translate into a pesticide use reduction but in a careful watch of the orchard evolution so as to find the best balance between achieving the requested quality and avoiding risky situations that could threaten the crop.

Documentation and assessment work is so considerable that, according to producers, it is difficult to carry it out without assistance. In the cases that we could observe, advisors have a leading role in the good compliance with supermarket requirements: they provide information about their change help design and fill out tables. They monitor the orchard’s evolution, and check fruit maturity and sometimes MRLs. They also represent producers at meetings on the revision of standard. They maintain links with other technical bodies and, together with the growers they accompany auditors which are regularly sent by supermarkets—at the expense of producers—to check compliance with the supermarket requirements. Those advisors are paid by the producers or the producers organisations, sometimes they come from public advisory boards (in the case of Hungary for example), sometimes they are independent and hired by the POs or the producers but they can also come from chemical companies. In most countries, the three types of advice can be found and also combined by the growers.

In the countries studied, most procurement standards and certification schemes created by supermarkets don’t explicitly encourage non-chemical practices in the orchards but, at best, acknowledge their existence. At best, they acknowledge the existence of low input practices without encouraging them. For example, GlobalGAP has introduced the notion of IPM in its revised version of September 2007. It gives one minor must⁶ for each of the criteria listed in Table 2 with no specific support to low input strategies (i.e. Substitution or Redesign strategies) even though non chemical approaches are considered as more risky by all the actors. Such a situation might change as discussions about a new standard version are ongoing.

⁵ “The HACCP is a system which identifies evaluates and controls hazards which are significant to food safety. The HACCP is interested in the three classes of hazards to food hygiene: biological hazard (virus, bacteria...), chemical hazard (pesticides, additives...), physical hazard (wood, glass...)”.Source: http://www.haccp-guide.fr/definition_haccp.htm

⁶ Certification schemes are made of Major Musts which are compulsory and of Minor Musts, a certain percentage of which should be complied with for being certified. In the case of GlobalGAP the producer should comply with 95 % of the Minor Musts. Source: <http://www.globalgap.org>

Table 2. Minor musts related to IPM in the GlobalGAP Standard.

Minor Must	Connection with the ESR model
Implementing at least one activity of prevention such as use of physical or biological barriers to avoid pest incidence; improving soil structure, selection of appropriate plant varieties	S and R
Implementing at least one activity in observation and monitoring such as regular inspection of pest incidence in crops; identification and inspection of the presence of natural enemies of pests; the use of pheromone and other relevant trapping systems for pest monitoring, using decision-support systems	E and S
Implementing at least one activity in intervention such as the use of approved selective plant protection products which have reduced adverse impact on non-target species (e.g. insect growth regulators, insecticidal soaps, mineral and vegetable oils, plant extracts); use plant protective products in a selective manner ⁷	E and S
Assistance through training and advice	E
Plant protection products and treatments are justified	E
Where plant protection products have been used, protection has been achieved with the appropriate minimum input	E

Source: GlobalGap, 2007

However, other supermarkets have already introduced certification schemes that explicitly refer to IPM.

Supermarket “IPM” certification schemes

While in the Netherlands, supermarkets only require their suppliers to be GlobalGAP certified; in other countries, some supermarket brands such as Migros, Carrefour, Tesco, REWE for example, have gone further and introduced schemes that precise the conditions of IPM production. Those brands consider their certification scheme as part of their brand added value and have tried to turn them into a competitive advantage. This explains why it has been very difficult to find information about them and, when it was the case, confidentiality agreement made us unable to write about them in details. However, generally speaking and with different levels of enforcement (minor or major musts) those schemes are self proclaimed and generally composed of requirements about IPM methods that can be related to:

-The definition of efficiency strategies given in the introduction.

i) Bans of some molecules which are still legally authorised in pesticides. By doing so, supermarkets anticipate the consequences of medical research results. For example, according to a manager, organochlorides were banned many years before their legal ban because of the possible long term impact of their metabolisation in body fat. According to growers, in the areas with strong codling moth pressure the restrictions in the chemical pesticide list makes the use of pheromone traps (i.e. Substitution) compulsory whatever the certification schemes.

ii) Soil analysis;

iii) In Western EU, traineeship and independence of advisors from the pesticide input supplier extension services. According to some producers, switching from the extension of the input supplier to the one provided by their Producer Organisation has had a positive impact on the quantity of pesticide used per year (up to -10 %).

iv) Respect of standards such as specific delays before harvest, no post harvest treatments.

v) Define the observations in the orchards that are necessary to document before treatment,

⁷ Use plant protection products selectively and in ways that reduce the risk of resistance developing.

Use natural enemies and other commercially-available biological methods of control.

Use other methods to control pests: including mechanical methods, i.e. controlling weeds by mowing and/or mechanical cultivation; use of traps for insect pest control, etc...

Supermarkets schemes also require results such as the respect of MRLs, and sometimes zero residues on fruit. This can lead growers to implement what we could refer to as substitution strategies

- *Requirements for methods that can also be related to substitution strategies.* In some cases, supermarket “IPM” schemes ask for the use or for the generalization of pheromone traps in the orchards and/or limits the area with chemical weed control and grass mowing in the strip between tree rows, hence favouring the development of beneficial organisms. Those standards should be applied on the whole farm or at the plot level. They are often completed by the use of environmental indicators (energy use, waste management, maintenance of the local fauna) taking into account the whole farm environment but rarely creating specific links with pesticide use (hedges). Growers don’t perceive supermarkets IPM schemes as paths toward better environmental practices but rather as prerequisites for market access or for access to the preferred supplier category i.e., suppliers that supermarket will call prior to the others. This is confirmed by some supermarkets representatives: *“if they want to be our supplier, they are obligated to apply the standards*

The growers’ perception is anchored in the fact that their efforts to achieve the standards are not rewarded by the supermarkets. In fact, supermarkets:

- Rarely commit to buy IPM produced crop except in some Central EU countries where they might establish contracts that last over one year in order to secure their supplier loyalty.
- Seldom provide financial support to IPM growers as a reward for adopting non-chemical strategies. When they do it, it is on such a small scale that it does not constitute a decisive element. For example, one supermarket studied gives a price bonus that does not even cover the extra costs of orchard monitoring or certification; another used to pay for soil analysis only.
- Don’t support the sale of IPM products through their marketing strategies either. When communicating about their schemes, supermarkets don’t communicate about IPM or on the decrease of pesticide use but rather on their environmental friendliness or on the taste of the products. An explanation is that supermarkets don’t always apply their scheme to their whole supply, therefore, communicating on less pesticide use would emphasise by contrast that part of their offer has been produced in a non-IPM way. In any case, supermarket representatives declare that IPM is too complicated for being communicated to the consumers. In fact, some schemes that have tried to do so failed. But it can be because of lack of supermarket support. For example, in Hungary, a public scheme embodied in a label called “Guaranteed Healthy Apple” was launched in 1997 with no commercial success. According to the interviewees, this was linked to the lack of interest of newcomers supermarkets and a low marketing support. To the contrary, “Agriculture Raisonnée” a French public “IPM” scheme⁸ promoted in the press as environmental friendly was remembered by half of the participants of the focus groups even though it is almost not in use anymore since the ruling which, in 1999, has forbidden any communication on the products about it (CNL, 1999). Moreover, it could be noticed that some participants were ready to consider that including low input strategies in the standards of existing quality labels such as the Label Rouge (Red label) or labels of protected designation of origins was meaningful all the more so as all participants were expressing a strong economic solidarity with the growers of their areas, choosing their fruit prior to other ones. In addition, *because the requirements for physical standards are the same as for IPM and non-IPM non certified production*, the growers work is very difficult and highly technical: they have to achieve the same productivity level at the same quality with fewer chemicals i.e. by taking more risks with no financial reward. Moreover, when the schemes involve “Substitution” elements, they never require the use of pesticide resistant varieties and, in some cases, impose that the standards should be applied on pest sensitive ones (Gala for example) which is contradictory to the objective of IPM and makes the grower work even more difficult.

⁸ Considered by many stakeholders including NGOs as mostly repeating what should now be done if one simply applies the law without any objective of pesticide use reduction.

Such a situation has a double consequence. First, only the most skilled and trained growers can achieve a reasonable crop within those IPM schemes. As a Swiss advisor said, these producers constitute a kind of “elite” of growers. The result is that many growers are excluded from supermarket supply. This can be observed in Western EU where the advisors of the producer organisations acknowledge the fact that they know the growers who will be able to perform according to the standards, that they select them and concentrate on them. It can also be observed in Central Europe where the majority of fruit growers working for supermarkets have graduated in horticulture at University or colleges. In Poland, for example, many of them stayed for a while in the USA during the eighties to gain experience in fruit growing and have been using new technologies since (Interviews, 2009). To this extent the pesticide case is another example of the social discrepancy between farmers as a consequence of supermarket supply that was already analysed in the South (Raynolds, 2004; Charlier et al., 2006). It also leads to a change in the “Spirit of farming” (Rosin, 2008) i.e. successful farming is increasingly associated with the individual’s ability to conform to the audits that goes together with the schemes. Second, these skilled growers feel torned between the financial risks associated with IPM which impacts their capacity of making a decent living and their desire to continue to be registered as preferred suppliers. Consequently, will tend to expand their orchards and to intensify their production, others would prefer to step out of supermarket IPM schemes rather than risk losing their crop. Others will rather use their skills to produce for food chains that will financially reward the difficulty of their work i.e. baby food but also, sometimes, organic food. To this extent conversion to organic can also be the outcome of a financial dead-end in conventional agriculture (Lamine et al., 2008).

Increasing the consumer interest for low-input practices could represent a drive for the adoption of those practices by the supermarket and their suppliers. Results of the focus groups in FR, IT and GB show that it is difficult to make consumers understand the issue of fruit protection. Even those who are living in orchard areas had no or very little ideas of pesticide management constraints. But they were aware of the pesticide risks for the environment and, even though formulated in different ways, of the risks that pesticides represent for human health. A question is therefore to which extent the consumers could influence supermarkets for making them supporting low input practices. Referring to the French focus groups, and having in mind that lower level of skin quality could be acceptable by some consumers hence representing an opportunity of evolution toward Substitution or Redesign strategies, three other major elements could interfere. The first one is the trust in the public authorities’ capacity of ensuring sufficient food safety levels. For example, some consumers couldn’t imagine that the French administration would authorise the use of pesticides the environmental and health impact of which would not have been thoroughly tested. Other countries like Spain were perceived as having a much less regarding pesticide authorisation policy and French fruit were perceived as safe. As long as this trust exists, there is no reason for the citizen consumer to look for retailers that would secure a higher level of IPM. When this trust didn’t exist, in the absence of proper IPM schemes, the alternative opened to supermarket consumers is the purchase of organic fruit. When this is not possible (because the price is too high), consumers who were often thinking that pesticides allow conventional growers to make a living, try to protect themselves with a systematic wash and/or peel of the fruit.

The existence of other retail forms represents the second opportunity. Indeed, in a market where supermarkets compete against each others to gain small market shares, a hypothesis is that the change of food circuit on the grounds of finding healthier food and/or criticising the conventional fruit production system could represent a threat that supermarket would react too. They have already done quick policy changes. For example, confronted with the development of alternative stores such as “World shops” selling Fair Trade products successfully, supermarkets have engaged in the commercialisation of Fair Trade products as well which has in turn led to the development of specific certification schemes (Charlier et al., op.cit). The existence and development of fruit purchase in farms, local shops, markets and through new retail forms such as Consumer Supported Agriculture (CSA) and with the acceptance of a lower skin quality or a smaller size is therefore important to sustain this possibility of evolution. Thirdly, NGOs representing the civil society and speaking on behalf of the consumer/citizen can influence both the consumer behaviour through

information campaigns and the supermarkets which fear them and try to anticipate their campaigns. Actually, after concentrating on the regulation decision process, some NGOs have now decided to develop their relationships with supermarkets and have started informal discussions with the technical staff (Haynes et al. 2008).

Conclusion

Driven by the need to avoid food scandals and/or NGOs campaign and to secure safe food, supermarkets have implemented fruit procurement standards that promote efficient pesticide use behaviour but can't support a move to non-chemical strategies. On one hand they have kept pesticide intensive elements such as standards of perfect fruit skin quality and pesticide sensitive varieties; on the other hand they don't compensate the extra costs of pesticide substitution. In other words, IPM is not considered by supermarkets as a path to the redesign of the cropping system that should be supported on the long run but as a sort of insurance scheme. IPM certification schemes that require the use of non chemical alternatives don't participate in the promotion of low input systems either. They don't give any market or financial reward to the growers. Because quality and productivity criteria are the same for both IPM and non-IPM products, maintaining the farm income is difficult. It requires high technical skills that all growers don't possess, hence participating to a selection of farmers able to produce for supermarkets. To this extent, at field level, IPM is mainly defined by supermarkets and growers have much less influence, which obviously has consequences for the potentials of IPM schemes to contribute to more sustainable farm practices.

Unless going further in the support of Substitution and Redesign strategies, it is not sure that self proclaimed supermarket IPM certification schemes will keep on supporting the brand added value for very long: the EU regulation evolves. Many active substances are going to be banned while IPM has become the subject of an EU directive⁹. To this extent the law will now induce the GAP Efficiency strategies that constitute many of the supermarket procurement requests and the restriction of authorized products might lead growers to adopt Substitution ones hence making the supermarket schemes lose their added value. Migros (CH) is a good example: its IPM scheme "Migros Sano" created in 1974 disappeared after the Swiss Federal government's adoption, in 1993, of a new agricultural policy which makes IPM compulsory for receiving Federal payments. Against this background, the only perspective for supermarkets that would still want to create an added value based on the type of orchard management will be to support more advanced forms of IPM. They might do so if pressured by the development of the consumers' choice for IPM products sold in other forms of retail.

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⁹ Regulation revising Directive 91/414/EEC COM(2006) 388 final
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